Journal of Luminescence 38 (1987) xi–xvi
North-Holland, Amsterdam

CONTENTS

Preface vii

List of Committees viii

Foreword, M.D. Sturge ix

Contents xi

Section 1. Localization, Delocalization and Transport

Exciton transport and Anderson localization in Liouville space: The effective dephasing approximation
Mukamel, S., D.S. Franchi and R.F. Loring 1

Unusual transport of excitations in quasiperiodic systems
Abe, S. and H. Hiramoto 3

Section 2. Optical Hole Burning

Picosecond photon echo and optical hole burning studies of chromophores in organic glasses
Berg, M., C.A. Walsh, L.R. Narasimhan and M.D. Fayer 9

Hole-burning spectroscopy in dye-doped polymers by spatial modulation technique
Saikan, S., Y. Kanematsu, R. Shiraishi, T. Nakabayashi and T. Kushida 15

Photon-gated spectral holeburning
Macfarlane, R.M. 20

Optical hole-burning in organic glasses
Van den Berg, R. and S. Völker 25

Photon echoes and persistent hole burning in organic amorphous systems
Nakatsuka, H., H. Sugiyama and Y. Matsumoto 31

Photon echo relaxation and hole burning in Tb^{3+}:$LiYF_4$ and $LiTbF_4$
Liu, G.K., M.F. Joubert, R.L. Cone and B. Jacquier 34

Spectral hole burning: High-resolution optical spectroscopy and image storage
Renn, A., R. Locher, A. Meixner and U.P. Wild 37

Optical hole burning and optical-RF double resonance studies in CaF_2:Pr^{3+}:O^{2-}
Hasan, Z. and N.B. Manson 40

Photochemical hole burning and its quantum yields of quinizarin and 1,4-substituted anthraquinone derivatives in glass matrices
Tani, T., Y. Iino, M. Sakuda, A. Itani, H. Nakahara and K. Fukuda 43

Two-laser spectral hole burning in a colour centre in diamond
Reddy, N.R.S., N.B. Manson and E.R. Krausz 46

0022-2313/87/$03.50 © Elsevier Science Publishers B.V.
(North-Holland Physics Publishing Division)

Photochemically induced hydrogen elimination and hole burning in solid state reactions of doped fluorene crystals
Prass, B., C. von Borczyskowsky and D. Stehlik 48

Section 3. Excitons

Dynamical relaxation process of characteristic band edge exciton states in layered BiI_3 crystals
Karasawa, T. 51

Urbach rule in luminescence and dynamics of a momentarily localized exciton in PbI_2 and HgI_2
Goto, T., J. Takeda, T. Ishihara and M. Matsuoka 55

Temperature dependence of exciton lifetime in Cu_2O
Reimann, K. and R. Wille 60

Energy and dephasing relaxation of weakly localized quasi-two-dimensional excitons in quantum well structures
Takagahara, T. 64

Transport anisotropy and percolation in exciton dynamics
Parris, P.E. 67

Exciton dynamics in ZnTe under exciton resonance excitation
Kurita, A., Y. Fujikawa and T. Kushida 70

Transient dispersion and absorption changes due to the exciton population dynamics
Levy, R., R. Leonelli, A. Manar and B. Hönerlage 73

Transverse and longitudinal relaxations of excitons and biexcitons in CdSe
Hvam, J.M., I. Balslev and C. Dörnfeld 76

Time-resolved luminecence due to localized excitons in mixed crystals
Swoboda, H.-E., F.A. Majumder, C. Klingshirn, S. Shevel, R. Fischer, E.O. Göbel, G. Noll, P. Thomas, S. Permogorov and A. Reznitsky 79

Resonant photoemission from surface core excitons on GaAs(110)
Cho, K. and Y. Miyamoto 81

Dynamics of excitons localized by disorder in semiconductors
Minami, F. and K. Era 84

Dynamical studies of triplet–singlet pairs for bound excitons related to complex defects in GaP
Bergman, P. and B. Monemar 87

Tunneling and relaxation from the free state to the self-localized state of the exciton nonadiabatic multi-step theory
Nasu, K. 90

Exciton dynamics in rare gas solids and alkali halides
Kmiecik, H.J., M. Schreiber, T. Kloiber, M. Kruse and G. Zimmerer 93

Self-trapped excitons in KI:Br and RbI:Br
Hayashi, T., T. Ohata and S. Koshino 96

Energy transfer by exciton-polarons in $RbMnF_3$
Wünsch, F.R., V. Gerhardt and W. Gebhardt 99

Temperature dependence of the triplet exciton ESR line shape in dimers
Reineker, P. and R.G. Winkler 102

Phase shift of an exciton scattered by a surface
Nakayama, M. and M. Matsuura 104

Virtual and real processes in resonant light scattering in an exciton–LA-phonon system
Sakai, M. and T. Iida 106

Temporal behavior of secondary emission in exciton states under the dynamical stark effect
Iida, T. and T. Higashimura 109

Section 4. Interaction and Relaxation

Relaxation in restricted geometries
Klafter, J., A. Blumen, G. Zumofen and J.M. Drake 113

Towards a unified description of polaron and soliton transport
Brown, D.W., K. Lindenberg and B.J. West 116

Energy transfer and anomalous electrical properties of optically excited ruby
Kaplyanskii, A.A., S.A. Basun and S.P. Feofilov 120

Optical dephasing of impurities in glasses at low temperatures
Reineker, P. and K. Kassner 125

Localized and delocalized proton levels in hydrogen bonds: Fluorescence line narrowing and Stark effect measurements
Trommsdorff, H.P. 129

Optical and vibrational dephasing in crystals: Theory and experiment
Skinner, J.L. and D. Hsu 134

Non-adiabatic electron–phonon interaction: Investigation using continued fractions
Scheuing, A., P. Reineker, C. Durst and E. Sigmund 137

Anomalies in the intensity of the resonant secondary radiation of F-centers in KCl
Kayanuma, Y., Y. Mori and H. Ohkura 139

Exact non-adiabatic solutions of the Peierls–Hubbard Hamiltonian
Schmidt, W. and M. Schreiber 141

Vibronic coupling in two-photon absorption
Barker, T.J., R.G. Denning and J.R.G. Thorne 144

Up-conversion by V–E transfer in rare gas crystals doped with molecular defects
Dubost, H., J.P. Galaup and R. Charneau 147

Vibrationally "hot" valence luminescence of NO in Ne matrices
Chergui, M., N. Schwentner and V. Chandrasekharan 150

Section 5. Disordered Systems

Transient properties of photo-excited conducting carriers in a disordered As–Se system
Arai, T., Y. Yoneyama and S. Onari 153

Fluorescence line narrowing in uranyl glasses
Thorne, J.R.G., A. Harrison, I.D. Morrison and R.G. Denning 156

Section 6. Localized Centers

Dynamical relaxation processes of optically excited F centers studied by the resonant secondary emission
Mori, Y., H. Hanzawa and H. Ohkura 159

Hot luminescence and non-radiative transition of F centers in KCl and NaCl crystals
Kondo, Y., T. Noto, S. Sato, M. Hirai and A. Nakamura 164

De-excitation pathways of vibrationally excited excitons
Tanimura, K., S. Suzuki and N. Itoh 168

Picosecond resonance fluorescence and energy transfer of localized electronic states in silver halides
Schreiber, E., H. Stolz and W. von der Osten 173

Thermally activated non-radiative decay process in KI:Se_2^-
Murata, H. and R. Kato 176

Time resolved spectroscopy in nano- and picosecond ranges on the F center formation process in KI crystals
Suzuki, Y., E. Kitamura and M. Hirai 178

Long lived red luminescence in diamond
Pereira, E and L. Santos 181

Spin cluster excitations in Ti^{2+} doped $MnCl_2$
Jacobsen, S.M. and H.U. Güdel 184

Excited state absorption of V^{2+} and Cr^{3+} ions in crystal hosts
Payne, S.A. and L.L. Chase 187

Coexistence of two excitation transfer mechanisms in $LiYF_4:Pr^{3+}$
Barthem, R.B., R. Buisson and J.C. Vial 190

Measurement of ionization rate of photoexcited divalent rare earth ions in fluorite-type crystals
Fuller, R. and D.S. McClure 193

FLN and energy transfer in the mixed oxide system α-$Al_{2x}Ga_{2(1-x)}O_3:Cr^{3+}$
Morgan, G.P., F.J. Bergin, T.J. Glynn, G.F. Imbusch and J.P. Remeika 195

Dynamical processes involving local modes for rare earth centers in CaF_2
Reeves, R.J., G.D. Jones, N.J. Cockroft, T.P.J. Han and R.W.G. Syme 198

Rate equation description of multi-photon creation of color centers and simultaneous one-photon annihilation
Pogatshnik, G.J. and D.S. Hamilton 201

Coherent transients of the relaxed excited quartet state of O_2^- in CaO
Glasbeek, M. and P. van Leeuwen 204

Time resolved measurements of polarized luminescence from relaxed excitons due to I^- dimers in KBr:I
Tanaka, K., T.Mukai, O. Arimoto, K. Kan'no and Y. Nakai 207

Section 7. Phonon Dynamics

The excited state as a source and detector for high frequency phonons
Meltzer, R.S. 211

Frequency-selective time-resolved phonon spectroscopy using fluorescence line narrowing
Van Dort, M.J., J.I. Dijkhuis and H.W. de Wijn 217

Section 8. Resonant Raman Scattering

Non-Markovian effects in transient resonant light scattering
Aihara, M. 221

Spectral and temporal behavior of resonant secondary emission in $NaNO_2$
Kato, R., T. Sakai, H. Kawaura and Y. Kawaguchi 225

Resonant Raman scattering and exciton localization in GaP:N and $GaAs_xP_{1-x}$:N
Gershoni, D., E. Cohen, A. Ron and M.D. Sturge 230

Section 9. Non-linear Optical Processes

Optical Stark effect of excitons in semiconductors
Fröhlich, D., K. Reimann and R. Wille 235

Nonequilibrium many-body theory of the optical band edge nonlinearities
Haug, H., J.F. Müller and R. Mewis 239

Large-sample effects in superfluorescence of O_2^- centers in KCl
Schiller, A., L.O. Schwan and D. Schmid 243

Optical nonlinearities in the exciton resonant region studied by polarization spectroscopy
Kuwata, M. 247

Four-wave mixing spectroscopy of Cr-doped laser crystals emerald, alexandrite, garnets and ruby
Powell, R.C., A. Suchocki, G.D. Gilliland and G.J. Quarles 250

Excitonic optical nonlinearity in PbI_2
Ishihara, T. and T. Goto 252

Coherent pulsations in the vibrational fluorescence of CO and NO in solid N_2
Zondy, J.J., J.P. Galaup and H. Dubost 255

Direct two-photon absorption of $Gd(OH)_3$ and $GdCl_3$ in an applied magnetic field
Jacquier, B., Y. Salem, C. Linarès, J.C. Gâcon, R. Mahiou and R.L. Cone 258

Optical effects in Raman–heterodyne-detected NMR in Pr^{3+}:LaF_3
Takahashi, Y., T. Tanaka, H. Hatanaka, Y. Fukuda and T. Hashi 261

Section 10. Semiconductors

Picosecond dynamics of magnetic polarons in $Cd_{1-x}Mn_xTe$
Oka, Y., K. Nakamura, I. Souma, M. Kido and H. Fujisaki 263

Magnetic polaron formation of localized excitons in semimagnetic semiconductor alloys of $Cd_{0.8}Mn_{0.2}Te$
Itoh, T. and E. Komatsu 266

Dynamical aspects of edge luminescence in orthorhombic InI
Nakamura, K., T. Kishigami, Y. Sasaki, N. Ohno and Y. Nakai 269

Polariton distribution in ZnTe and CdTe
Borenstain, S. and E. Cohen 272

Temperature dependence of luminescence in mixed crystals
Nakahara, J., S. Minomura, H. Kukimoto, F. Minami and K. Era 275

Dynamics of various types of optical bistability and recent results on a CdS–SEED
Klingshirn, C., M. Wegener, A. Witt and C. Dörnfeld 278

Ultrafast dynamics in photoexcited carriers in GaAs
Watanabe, A., H. Saito, Y. Ishida, T. Yajima, M. Nakajima, J. Kadowaki, S. Tanaka and H. Kobayashi 280

Time-resolved optical spectra of highly excited semiconductors – theory
Schäfer, W., R. Binder and K.-H. Schuldt 282

Dynamical tunneling spectroscopy in photo-excited semiconductor superlattices
Masumoto, Y. and F. Sasaki 285

Section 11. Organic Molecules

Exciton dynamics in thin wires
Kopelman, R., L. Li, S.J. Parus and J. Prasad 289

Discrimination between thermally activated and direct energy transport mediated by induced energy funnels in disordered single crystals
Von Borczyskowski, C. and T. Kirski 295

Time-resolved photoinduced absorption of trans-polyacetylene from picoseconds to microseconds
Yoshizawa, M., T. Kobayashi, H. Fujimoto, J. Tanaka and H. Shirakawa 300

Proton transfer dynamics of benzo[c]cinnoline embedded in porous Vycor glass
Lin, C.T. and W.L. Hsu 305

Dynamics of optically excited tetraphenylporphyrin films evaporated on a conductive SnO_2 substrate
Suto, S., M. Yashima, W. Uchida and T. Goto 308

The effect of pressure on the electronic spectra of anthracene derivatives
Della Valle, R.G., F. Zerbetto, A. Brillante and K. Syassen 311

Dynamical processes of photo-polymerization and isomerization
Nagai, T., N. Nagaosa and E. Hanamura 314

Exiton trapping with coherent emission of phonons at impurities in molecular crystals
Singh, J. and A. Thilagam 317

Scaling concepts in energy transport and relaxation
Blumen, A., G. Zumofen and J. Klafter 320

Competition and coexistence of free and self-trapped excitons in aromatic molecular crystals
Mizuno, K. and A. Matsui 323

Femtosecond dephasing in a polydiacetylene film observed by degenerate four–wave mixing with an incoherent nanosecond laser
Hattori, T. and T. Kobayashi 326

Nonlinear optical properties of iodoform complexes
Fünfschilling, J., M. Ruggiero, M. Staehelin and I. Zschokke-Gränacher 329

Effects of saturation on the elimination of inhomogeneous broadening by nondegenerate fully resonant four-wave mixing
Carlson, R.J. and J.C. Wright 331

List of Participants 333

Author index 337

Subject index 343

Materials index 345